FRACTURE GRADIENT AND MAXIMUM INJECTION PRESSURE

INJECTOR 5

Fracture Gradient

In the project AoR there is no site-specific injection zone fracture pressure or fracture gradient. An injection zone step rate test will be conducted as per the preoperational testing plan. However, several wells have formation integrity tests (FIT) for shallower formations, details of which are provided in Section 2.5.2 of the Attachment A – Project Narrative.

For computational modeling and operational considerations, a frac gradient of 0.7 psi/ft was used, which should be below the actual frac gradient assuming the Winters Formation frac gradient would be similar to shallower zones.

Maximum Injection Pressure

CTV will ensure that the injection pressure is beneath 90% of the fracture gradient at the top of perforations in the injection wells. CTV expects to operate the wells with a planned bottom hole injection pressure well below the maximum allowable injection pressure calculated using the fracture gradient and safety factor.

Table 1 – Fracture gradient and maximum allowable pressure for Injector 5

Injection Pressure Details	**Injection Well 5**
Fracture gradient (psi/ft)	0.70
Maximum allowable bottomhole injection pressure (90% of fracture pressure) (psi)	6,146
Elevation corresponding to maximum injection pressure (ft TVD)	9,755
Elevation at the top of the perforated interval (ft TVD)	9,755